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SOCIETY OF ARTS.

FRIDAY, SEPTEMBER 16th, 1853.

THE NEW PATENT LAW AMENDMENT ACT.

An important Act of Parliament was passed last Session to amend, and to some extent supply, the deficiencies of the Act of last year. That Act, it is well known, though lingering through its early stages, was passed with some degree of haste at the close of the Session. To have attempted to make the Bill as perfect as its promoters could have wished, would at that time have endangered the passing of the Bill, and it was thought more prudent to let it remain as it was, and to trust to future legislation for its improvement. This is the object of the present Act.

Sect. 1 repeals the 33rd, and that part of the 28th section which directs that in case reference is made to drawings in any specification deposited or filed under the said Act, an extra copy of such drawings should be left with such specification.

By sect. 2, it is provided that "true copies of all provisional specifications left at the office of the Commissioners" shall "be open to the inspection of the public at such times, after the date of the record thereof respectively, as the Commissioners shall direct."

Hitherto, by the operation of the old law, the provisional specifications were not permitted to be inspected, and this clause gives authority to the Commissioners to exercise their discretion. Whether the provisional specification should be open for inspection at once, or kept secret till the complete specification is filed, is left to the Commissioners to determine. It would seem more in accordance with justice to others that the provisional specification should at once be made public, immediately on its being deposited at the offices. The applicant gets his protection; the public in return ought to know what it is for. Probably some intermediate course will be adopted, and the provisional specification be open for inspection at the end of three or four months.

By sect. 3, "a true copy, under the hand of the patentee, or applicant, or agent of the patentee or applicant, of every specification and of every complete specification, with the drawings accompanying the same, if any, shall be left at the office of the Commissioners on filing such specification or complete specification."

By sect. 4, it is provided that "printed or manuscript copies or extracts, certified and sealed with the seal of the commissioners, of letters patent, specifications, disclaimers, memoranda of alterations, and all other documents recorded and filed in the Commissioners' office, or in the office of the Court of Chancery, appointed for the filing of specifications, shall be received in evidence . . . without further proof or production of the originals."

This is a most important provision, and is intended to meet the objections to the clause in the Act of last year (Sect. 33 now repealed), which provided that copies by the Queen's printer should be evidence, however erroneous they might happen to be. It is obvious this clause will be of great convenience in the production of evidence at trials, and will tend much to reduce the expenses under this head.

By sect. 5, "certified printed copies, under the seal of the Commissioners, of all specifications and complete specifications, and fac-simile printed copies of the drawings accompanying the same, if any, disclaimers, and memoranda of alterations filed or hereafter to be filed under the said Patent Law Amendment Act, shall be transmitted to . . . . . Scotland and Ireland within twenty-one days after filing . . . . and shall be filed" there "respectively, and certified copies or extracts from such documents shall be furnished to all persons requiring the same on payment of such fees as the Commissioners shall direct; and such copies or extracts shall be received in evidence in Scotland and Ireland respectively."

This clause has for its object the simplifying the practice on the 29th Section of the Act of last year, and enables printed copies to be used; doubts having arisen whether printed copies were "true copies" under that Act.

It will be remembered that the Act of last year provided for the printing of specifications, &c., but omitted to limit any time; this section will now remedy this absurdity, and it is believed that the public will soon have the benefit of this most important part of the new patent law. It is understood that preparations are being made for supplying at a cheap rate not merely the printed copies of the current specifications, but those of past years. Series, too, will be got together, so that any one wishing to learn what has been patented in any one particular direction, may purchase that group in a printed form. Such, for instance, as a person requiring to know what has been done in reaping machines, may purchase that group of specifications, and thus see all that has been patented on that head.

By sect. 6, The Lord Chancellor, in certain cases, may seal letters patent after the expiration of provisional protection, when the delay has arisen from accident, and may extend the time for filing the specification thereon, and may also in case of accident extend the time for filing a specification, such time not to exceed one month. This is a liberal and wise provision, and of great value to patentees, who otherwise, by mere accident, might be irremediably deprived of most valuable rights. Such cases have occurred, and some very recently, and the patentee has had no remedy whatever: his patent, however valuable, was absolutely gone.

Doubts having arisen whether the provisions of the Patent Law Amendment Act, 1852, for the granting new letters patent for a further term, extended to the granting new letters patent by way of prolongation of the term of letters patent issued before the commencement of the said Act, by sect. 7, it is provided, "That where an Order of Council for the sealing of new letters patent shall have been made after the commencement of the said Act, the said provision . . . shall extend, and shall as from the commencement of the said Act be deemed to have extended," to the granting of "new letters patent for a further term, as well where the original letters patent were made before as where such original letters patent have been issued since the commencement of the said Act."

In addition to the printed specifications which will be soon available, it is understood that the Indices are in the course of printing, and that in a very few months they will be before the public. Patent Law reform though slow, seems at last to offer sanguine hopes that the great leading principles so long advocated by this Society, will be speedily realised in actual practice.

COLLECTION OF PHOTOGRAPHS.

This collection has now commenced its circulation, to be exhibited amongst those Literary and Scientific Institutions and Mechanics' Institutes which have made application for it, in reply to the notice a short time since inserted in the Journal. The following route has been drawn out, which admits of the collection remaining at each Institution about a week, and allows three days for its transmission from place to place. Those Institutions to which an asterisk * is prefixed have agreed to the General Interchange of Privileges; so that the members of any other Institution which may have agreed to this interchange, and has not applied for the loan of the collection, may still have an opportunity of examining it when in a neighbouring town.

1.*Woburn, Literary and Scientific Institution	from	Sept. 14	to	Sept. 26.
2.*Wellingborough, Mechanics' Institution, and Wellingborough Parochial Library and Reading-room	,,	Sept. 29	,,	Oct. 7.
3. Welshpool, Reading Society ...	,,	Oct. 10	,,	Oct. 18.
4.*Whitchurch (Salop), Mechanics' Institution	,,	Oct. 21	,,	Oct. 29.
5.*Chester, Mechanics' Institution	,,	Nov. 1	,,	Nov. 9.
6.*Stirling, School of Arts............	,,	Nov. 12	,,	Nov. 20.
7.*Crieff, Mechanics' Institution...	,,	Nov. 23	,,	Dec. 1.
8.*Aberdeen, Mechanics' Institution	,,	Dec. 4	,,	Dec. 12.
9.*Leamington, Royal Literary and Scientific Institution ...	,,	Dec. 15	,,	Dec. 23.
10.*Tyldesley (near Manchester), Mechanics' Institution and Mutual Improvement Society	,,	Dec. 26	,,	Jan. 3.
11.*Macclesfield, Society for the Acquirement of Useful Knowledge	,,	Jan. 6	,,	Jan. 14.
12.*King's Lynn, Conversazione and Society of Arts	,,	Jan. 17	,,	Jan. 25.
13.*Exeter, Literary Society	,,	Jan. 28	,,	Feb. 5.
14.*Wrington (near Bristol), Literary Society	,,	Feb. 8	,,	Feb. 16.
15. Ventnor and Bonchurch (Isle of Wight), Literary and Scientific Institution	,,	Feb. 19	,,	Feb. 27.
16.*Dover, Museum and Philosophical Institution	,,	Mar. 2	,,	Mar. 10.
17 *Ashford, Mechanics' Institute	,,	Mar. 13	,,	Mar. 21.
18. Hertford, Literary and Scientific Institution	,,	Mar. 24	,,	April 1.

Since this route was made out, applications have been received from

19. Greenwich, Society for the Acquisition and Diffusion of Useful Knowledge.
20. Cork, Royal Institution.
21. Bury St. Edmund's, Mechanics' Institution.
22. Salisbury, Literary and Scientific Institution.
23. Falkirk, School of Arts.
24. Wisbech, Mechanics' Institute.

It is arranged so that each Institution will remit it on to the next in rotation; and it is hoped that care will be taken to ensure regularity in this respect, and that the periods fixed will be strictly adhered to. It is obvious that for this the Institutions must depend on each other, the Society having no means of controlling the arrangements beyond that of determining the days on which it is to pass from one to the other. It is scarcely necessary to point out the importance of regularity in this respect; as unless it be attended to, the whole route must be thrown into confusion, and the Institutions disappointed.

The Council, in forming this collection, has had in view to extend as far as lay in their power, a knowledge and appreciation of the art of Photography. They believe, however, that the mere sending the collection with a catalogue, would be a very imperfect step on their part; and that it is necessary that it should be accompanied by something in the way of an account of the principles and processes by which these beautiful transcripts of nature are obtained. They are the more assured of this from the numerous inquiries on this head, which were made by visitors to the Exhibition held in their own rooms, showing how much information was required by the general public. For this purpose the following remarks have been put together.

It is not intended to write a treatise on photography; that would be out of place and unnecessary here; but to give a familiar account of the general principles on which the processes depend. Those who desire to take up the art for practice must look elsewhere for the niceties and detail of the manipulation.

The whole art depends upon a very simple fact or principle—the blackening action of light upon certain salts of silver. We are familiar with this in two forms, in the use of lunar caustic (nitrate of silver), and the common marking ink, also a solution of nitrate of silver. We all know that when lunar caustic is first applied to the skin, or marking ink used, how little, if any, stain or mark is visible; but that in each case, exposure to the light soon renders it gradually darker, till it becomes completely black. This is the simple principle on which the whole depends, though other combinations of silver are used, as more sensitive to light, and for other reasons. This being so, if we take a solution of nitrate of silver, and brush it over a piece of paper, and let it dry, no change takes place in the appearance of the paper. If it be then exposed to the light, it will shortly darken all over; but if, instead of exposing it wholly to the light, a portion of the paper is covered, say with a leaf, or piece of lace, or an engraving, it is obvious that those parts which are shielded from the light will remain unblackened, whilst those which are exposed will blacken; and we shall thus have delineated on the paper the facsimile of the leaf or lace, light on a black ground, or of the engraving, white lines for black, and black lines for the white portions of it. We should have what is technically termed a *negative picture*,—a term which must be carefully borne in mind. Having got this negative picture, it is clear that if we make use of this in the same manner as we did the leaf, lace, &c., and place it on another piece of prepared paper, and expose it to the light, we shall get a reverse of the *negative*,—that is, a picture with the lights and shades as in the original, technically called the *positive*. But it may be asked, How can we expose this negative to the light, as it is clear that the action of the light will cause it at once to blacken all over? This is accomplished by soaking the negative in a solution of hyposulphite of soda, which has the property of combining readily with those portions of the silver on the paper which have not been affected by the light, whilst it has little or no effect on those parts which have been blackened by the light. It, as it were, eats into those parts of the silver solution which have not been affected by the light, forming a soluble compound, which by repeated washings in water, is entirely got rid of, and nothing is left in the pores of the paper but the darkened portions of the silver salts. We have thus a picture which is practically unalterable by the action of light. This enables us to use it in the manner described. It has been found, however, that previous to covering the surface of the paper with the nitrate of silver solution, it is necessary, in order to obtain greater sensibility, and consequently more delicate tints, that the surface of the paper should first be covered with a very weak solution of common salt, and then hung up to dry. The process for taking the positive from the negative is termed *printing*, and there is no limit to the number of positives which may be taken from one negative.

If, instead of laying on to the sensitive paper the object to be copied, we expose the paper to the image formed in the camera obscura, we get on the paper a negative impression of the landscape, buildings, or other objects in front of the camera; from which, after being fixed by the hyposulphite, as before stated, a *positive* may be printed. This, in fact, was the first method employed; but the process was too tedious, too slow, and too deficient in detail, to be practically available. Mr. Fox Talbot, in experimenting on this subject, found out another salt, or combination of silver, which was extremely sensitive to the action of light, and which now forms the basis of every process at present practised, though disguised in various preparations. This was the iodide of silver, with a *slight excess of nitrate*, the iodide alone being insensible to light.

The method, generally known by the name of Calotype, or Talbotype, is shortly as follows: the surface of the paper is covered evenly with iodide of silver, and in this state it will keep any length of time, and is perfectly insensible to light. Previous, however, to use, a solution of nitrate of silver, with a portion of acetic acid and a solution of gallic acid, is applied to it, when it becomes at once extremely sensitive to the action of light. It is then exposed in the camera for a few minutes, depending on the brightness of the day or objects; and on being taken from the camera, the image, of which rarely any trace is then found, is made to appear, or developed, as it is termed, by washing the surface of the paper with a solution of nitrate of silver, mixed with a solution of gallic acid. The image shortly appears; and when of sufficient intensity, the paper is well washed in clean water, and the picture fixed by immersing it in a solution of hyposulphite of soda.

We have thus a negative, which is capable of affording an infinite number of positive pictures by the printing process above alluded to. The specimen enclosed between two glasses, and numbered 64 in the collection, is an example of a negative.

Such is the Calotype or Talbotype process, of which No. 22, by Mr. Fox Talbot, and Nos. 37 to 44, by Sir William Newton, are examples.

In order to make the negative more transparent, and give greater brilliancy to the positives, it is usual to wax the negative, by which greater sharpness and more detail is obtained. This is done by applying the negative to paper prepared as follows:

Take a solution of common salt in water, 5 grains to the ounce, with which brush the paper over evenly and carefully, and then hang to dry; it is then brushed over with a solution of nitrate of silver in water, 60 grains to the ounce, and then left to dry. The negative is laid face downwards on this sensitive paper, pressed tightly down to it by means of a piece of plate glass, and exposed to the light, when a positive picture is produced with the lights and shades as in the original objects; this is then fixed by the hyposulphite solution, as before described.

The *waxed paper process* is that which has been used by Legray in France, and brought to great perfection; the pictures numbered 2 to 11, by Mr. R. Fenton, and 70, by Mr. J. Sandford, have been taken by this process.

The paper is, in the first instance, carefully waxed, and the paper thus waxed is soaked in the iodizing solution, as it is called, consisting of iodide of potassium, bromide of potassium, cyanide of potassium, white honey, sugar of milk, and white of egg, in various proportions, mixed in distilled water, each operator using his own proportions. After soaking for about half-an-hour, the sheets are hung up to dry, and, in this state, they are termed iodized paper, will keep any length of time, and are insensible to light till made sensitive, by being completely immersed for a few minutes in a solution of nitrate of silver, with the addition of acetic acid. The paper is taken out, washed in distilled water, and dried between blotting-paper, and is then ready for use. The image, after exposure in the camera, is developed by plunging the paper into a saturated solution of gallic acid, and then fixed in hyposulphite in the usual way.

There is another process, termed the *collodion process*, which gives great brilliancy of detail, and is, from the rapidity of its action, peculiarly adapted for taking portraits. The pictures numbered 73 to 84, by Mr. P. H. Delamotte, are taken by this process.

A piece of plate-glass is covered with collodion (*i. e.*, gun-cotton dissolved in ether), with which a certain quantity of iodide of silver is mixed. The collodion is poured on the glass, the excess allowed to run off, and the plate of glass thus covered with a thin film of collodion, is plunged into a bath of nitrate of silver, and while wet is exposed to the image of the camera. A very few seconds suffice for the production of the image, which is developed, not by gallic acid, but by pyrogallic acid, dissolved in water, mixed with a certain quantity of acetic acid. We then get a negative image on the glass; but as the film of collodion is very tender, it is necessary before attempting to print from it, that it should be varnished with a white transparent varnish.

Sometimes a film of albumen with iodide of potassium is laid on a plate of glass, which is made sensitive in the same manner as the collodion film, but the process is very slow in its action, though the results are extremely beautiful. The picture numbered 30, by Messrs. Ross and Thompson (of Edinburgh) is thus produced.

IRON LIGHT-HOUSES.

A cast-iron lighthouse, ordered by the Lords of the Admiralty, was lighted up for inspection a short time since. The tower and internal fittings were manufactured by Messrs. Grissell, the lantern and light apparatus by Mr. W. C. Wilkins, of Long Acre. The lighthouse is intended for the Falkland Islands, and a similar one is constructing for Jamaica, while another was sent some time ago to Bermuda. The form of the present lighthouse is that of a frustrum of a cone, having a height of 47 feet from the base to the balcony floor, and a diameter of 14 feet at the base and 9 feet at the top of the tower, where the plates forming the balcony floor project beyond the body of the tower, and form a parapet around the outside of the lantern, the parapet being supported by eighteen ornamental cast-iron brackets fixed to the shell of the tower. Around the outer edge of the balcony floor a flange 4 inches deep is formed, which shields the connection of the ornamental brackets with the balcony floor, and the whole forms a circular abacus 15 feet in diameter as a capital to the tower. The shell of the tower consists of sixty concentric plates 1 inch thick, with flanges on the inside 4 inches wide, having holes to admit ⅞-inch bolts, drilled every 6 inches apart, both in the horizontal and vertical flanges. In the centre of the tower a cast-iron column is fixed for supporting the lighting apparatus of the Messrs. Wilkins, being a catoptric system of the second class, having fifteen improved Argand lamps placed in the foci of silver-plated and highly-polished paraboloidal reflectors, illuminating an arc of 225 degrees of the horizon; upon this column pockets are cast to receive the T iron joists, which support the two floors of wrought-iron chequered plates, there being an aperture in the floor to allow of sufficient headway up each staircase. The staircase consists of two stringings of wrought-iron, 5 inches wide and ½ inch thick, having pieces of 3-inch angle iron riveted on the inside, to which are bolted the oak treads; to each step there is an iron baluster ⅞ inch diameter, and fixed at the top to a wrought-iron hand-rail 1½ inch wide and ½ inch thick; the staircase winds helically around the inside of the shell of the tower, and is bolted at the top to the T iron joists which support the floor. There are three rooms in the tower, the first having a height of 16 feet 1 inch; the second, 15 feet 8 inches; and the third, 15 feet 3 inches from floor to floor of each room respectively. In each room there are four windows, having strong oak casements; they are 16 inches square and 1½ inch thick, and are glazed with polished plate glass 9½ inches square. The entrance to the tower is by means of a doorway formed in the centre of one of the concentric plates, having a strong oak door opening outwards, as also do the windows. The form of the lantern is octagonal, having a diameter of 8 feet over the corners and a height of 11 feet to the eaves of the lantern roof, which terminates in a cowl of peculiar construction. On the summit of the roof a conical pipe is fixed, in the inside of which is the foot-step or pivot and the guide for the rod of the arrow vane, and fixed to the rod of the vane is a large hollow ball, having the conical pipe inserted into it on the underside, the ball being free to swing round the pipe; the hollow ball is fixed to this vertical rod of the vane, and is perforated on that side next to the feather of the arrow, so that the heated air and gases from the burners may always rush through the perforations into the partial vacuum created behind the ball by the force of the wind. The total height from the base of the tower to the top of the vane is 67 feet 6 inches; the height from the base to the centre of the system of lights is 15 feet; the total weight of tower and lantern inclusive is nearly fifty tons.

MACHINERY FOR ORNAMENTING TIN-PLATES, ETC.

Messrs. John Smith, William Henry Smith, and Alexander Williams, manufacturers, of Upper Fountain-place, City-road, have just specified their improvements in metallic plates, and in producing devices or ornamental patterns thereon, and in the apparatus and machinery to be used for such purposes. The specification is as follows:—"Our invention consists in, and has reference to, improvements in metallic plates, especially tin-plates, and plates of similar hardness, by giving a superior surface thereto, and by producing devices or ornamental patterns thereon; and in the apparatus and machinery used for such purposes in regard to the specialities in the construction thereof, in order to subserve these objects. We can obtain a superior surface, as hereafter stated, and we can produce devices or ornamental patterns, by embossing or impressing in a continuous manner on the surface of metallic plates any desired device, pattern, or ornament, by means of steel or steel surface rollers, impressed, chased, or engraved when in a soft state with the required device, pattern, or ornament (in reverse of what is intended to be produced on the plate), and afterwards hardened. The plates are to be passed through two rollers, one having the pattern thereon, and the other being a pressure or counter roller; and when it is required to bring the plate out flat, it must be passed through ordinary bending or flattening rollers, which may, if desired, be attached to the first-named rollers. To enable the practical man to construct and prepare the rollers first-named, it will be sufficient to state that they may be of the general form and structure usually adopted for rolling metals, as now practised, the size and form being governed, of course, by the circumstances of the case; and like those for paper embossing, they will be first formed in soft metal, and then embossed, engraved, or impressed by any convenient method, and then hardened. In this invention, however, the pressure, or counter roller, is not to be of hardened metal, but is to be a soft metal roller—for instance, a soft wrought-iron roller, as a hard metal roller would present too unyielding a pressure to the plate under operation, and thus render it difficult to produce the impression required thereon. The two rollers, the hard or impression roller and soft or counter roller, to be connected and geared together, so as to form a pair of rolls as adopted with rollers for rolling metals, and motion communicated in the same manner, and the flattening rollers may be of any ordinary kind.—*Claim*: Having now described the nature of the said invention, and in what manner the same is to be performed, we further declare that we claim in respect thereto the improvements in metallic plates, especially in tin-plates, and in producing devices or ornamental patterns thereon by the use and adoption of the improvement in the apparatus to be used for those purposes, as hereinbefore set forth and described."

HOME CORRESPONDENCE.

PATENTS.

LETTER V.

SIR,—Has it ever occurred to those who advocate patents as the best mode of compensating inventors for their trouble, to calculate how much a year this compensation costs the patentees collectively? Taking even the cheaper rates at which the Crown now sells the article, and the patent-agents advertise their services to procure it, and allowing for a large proportion of them never going beyond the first stage (*i.e.* being abandoned before the second payment to the Crown becomes due at the end of three years), I should think 100*l.* will be quite within the mark as the average expense of getting a patent. And as they seem to be going on at the rate of 3,000 a year, we may pretty safely say, in round numbers, that at least 300,000*l.* is the gross annual quit-rent paid by patentees for the enjoyment of their monopoly.

But there is also another item to be taken into the account, before anybody can be sure that he has got what he has paid his money for—and that is the cost of a law-suit. For it must not be forgotten that the thing called a patent is really nothing more than the right of bringing an action, or filing a bill in Chancery, against anybody whom the patentee considers an invader of his monopoly. And if there is a subject proverbial for breeding litigation (always excepting the lawyer's real friend—the man who makes his own will)—and litigation of the most expensive kind, on account of the battalion of scientific witnesses usually called on each side, and who must be paid for examining the subject in order to give their evidence—that subject is patents. I have not, of course, and probably nobody has, any means of giving a probable estimate of the average cost of patent litigation per year; but it must be a small and simple case of which the cost is under 1,000*l.*: and in addition to those which actually reach a trial, there are many others compromised or referred to arbitration, on account of the notorious uncertainty of the result which the twelve intelligent men in the jury-box may arrive at on a subject which perhaps three of them may understand, and on which the evidence is certain to be flatly contradictory, as that of scientific witnesses and horse-dealers always is.

This sum of about 300,000*l.* a year, then, together with as much more as may represent the annual cost of patent litigation, is the price paid by patentees for the purchase of their tickets in the patent lottery. Now, does anybody seriously believe that the inventors of this kingdom annually receive prizes to anything like that amount by reason of their patents? Of course, I am far from admitting that if they did, that would be any reason for the retention of a system which I believe to be injurious to the public, obstructive to science, and wrong in principle. But, on the other hand, if patents are not on the whole remunerative to inventors (for whose benefit alone they are supposed to be designed), it is clear that inventors as a class are not interested in keeping them up, and that the public is sacrificing itself by the monopoly which it grants to patentees, for the sole benefit of the capitalists who make money by the few profitable patents, and of the various orders of professional men who are engaged in procuring, defending, and defeating them.

It may possibly be said, that if all kinds of speculation are to be stopped which are likely to be unprofitable to those who engage in it, many projects would be stopped which are beneficial to the public, though very unremunerative to the projectors. But there are two very material points of difference between the speculation in patents, and in making Trent Valley and Caledonian Railways, or other works, of which the public gets the use, though the shareholders get no profit. In the first place, these works are not made by taking away any privilege whatever from the public. The only persons against whom compulsory powers are given are the landowners; and as they generally get three times as much for their land as it is worth, in addition to the advantage of having the use of the railway when it is made, the analogy is certainly not very striking between the interference of a railway with land-owners and the interference of a patent with subsequent or contemporaneous inventors. Secondly, the analogy fails even more in this—that the works in question are at any rate made for the convenience of the public, and the charges for using them limited by Act of Parliament: whereas, patents are exactly the opposite in both respects, giving to the possessors the right to use the invention or to suppress it, solely according to their own convenience, and without any limitation as to the price at which they shall allow the public to have the use of it.

The apprehension which everybody but a very rich man naturally feels of a patent lawsuit, has been frequently turned to good account by the owners of bad or expired patents, or even of no patents at all. It was proved before the Patent Committee to be not an unusual trick for such people to go round to a number of persons whose means, either of standing a lawsuit or obtaining correct information, are small, and to tell them that they are probably not aware that something they are using every day (agricultural implements, these birds of prey seem specially to fasten upon), is an infringement of a patent, and that the patentee is determined that all trespasses on his property shall be prosecuted with the utmost rigour of the law; but in consideration of the infringement having possibly been made in ignorance, he benevolently consents to waive legal proceedings, and to allow the unhappy agriculturist to go on crushing his clods or churning his butter in peace, provided he will pay at once a reasonable sum by way of compromise or compensation. One can easily conceive that the reasonable sum is generally forthcoming, especially as we may be sure it will be ingeniously proportioned to the probabilities of payment or resistance. And considering the difficulty which ordinary people would have in ascertaining whether the pretended patent was or ever had been in existence, and the expense of employing solicitors and patent-agents to search, and that their searches are often fallacious, and sometimes grossly fraudulent; and considering also, not the difficulty, but the impossibility of ascertaining, without a trial at law, whether a patent really in existence is good or bad; I do not see how it would be possible to meet this kind of proceeding by any legislation—except that of abolishing patents altogether.

Even where an action is brought by a *bonâ fide* patentee, honestly believing his patent to be good, though it might turn out to be bad, if properly tried, it is very often the more prudent course for the defendant to pay a largish sum, or to submit to the payment of a moderate royalty to compromise the claim, than to run the risk of an expensive litigation, and of having his works stopped, and an account to be rendered at the end of it by an absurd verdict of a jury, who are generally prejudiced in favour of a patentee, and regard the defendant as probably an evader morally, if not an invader legally, of the patent. I remember the author of a well-known book on patents, who has probably more legal practice of that kind than anybody else, advising a defendant to compromise in an apparently plain case of a bad patent, with the remark, that a jury was as likely as not to find a chemical invention to be an invasion of a mechanical patent.

The converse of this is equally true also. Not only do the possessors of bad or pretended patents often succeed in extorting money under claims of compensation or damage for invasion, but the owners of perfectly good patents fail altogether in supporting them. If a patentee is not rich enough to fight, he may as well have no patent at all. If the invaders are very small in magnitude, and very large in numbers, it becomes impracticable to hunt them down; and so a patent may fail from the poverty of the defendant as well as of the plaintiff. There was a remarkable instance of this mentioned before the Committee: Sir David Brewster said, that if he could have successfully prosecuted the pirates of his patent for the toy called the *kaleidoscope*, which used to be in every house about thirty years ago, he should have made a fortune by it; but that they were made or imported to such an extent by Jews, and small dealers, against whom it was hopeless to carry on legal warfare without spending more in costs than he would recover in damages; that the attempt was abandoned, and the patent therefore practically abandoned too. I say nothing of the somewhat ludicrous spectacle of a man of Sir David Brewster's eminence first being on the point of making a fortune, not by any of his really important scientific investigations, but by an accidental discovery of a plaything; and, secondly, of his just missing it by reason of the invention being such that it could be pirated with impunity on account of the pirates not being worth the powder and shot. But as just the same thing might and would happen with any other more valuable invention, which is subject to the same kind of piracy, the illustration is a perfectly good one of the inadequacy of patent laws to protect one considerable class of inventions from fraudulent invasion, as they are inadequate to protect another set of persons from fraudulent or unfounded claims under pretence of invasion.

There are a multitude of other cases in which there is no manner of doubt that a second invention was entirely suggested by a first which is patented, and yet the second is so different in form that it cannot legally be held an invasion of the first. I mentioned the case of Kyan's anti-dry-rot patent in the second letter.

There are instances—one very famous one—on which, it is said, 20,000*l*. was spent in law, in which there has been no difference between two inventions beyond that of the proportions of the parts, or the distance at which some action was to take place, and yet the second has been held not an invasion of the first; and I do not mean to say wrongly held, inasmuch as a difference of this kind (as was the case in a clock-escapement, about which there was a good deal of controversy, in the Exhibition of 1851) is sometimes quite enough to make the difference between the thing answering and not answering; and yet no human being can fail to see that the second invention is a mere imitation of the idea of the first; and but for the first, might not have been made at all. So that in these cases you must take your choice whether to let the second patent stand for an invention which is clearly not original, or to refuse it because there was a previous patent for the thing which suggested the successful invention, though it did not itself succeed. I cannot see anything like real justice in either alternative; nor can I see how either of the two inventors could complain of injustice if neither of them were allowed to have a patent; the one for the thing which is imperfect, the other for a thing which is not original.

Again, in such cases as that American one which you printed in the Journal of the 3rd instant, it is very difficult, if not impossible, to say on which side the balance of injustice lies. If a man invents and makes a thing only for himself, it seems very unfair that he should some years afterwards find himself stopped from using his own invention because somebody else has since re-invented and patented it, and got the patent maintained on the American ground, that the first invention might be reckoned among the *artes perditæ*. And, on the other hand, if *bonâ fide* inventors ought to be protected by patents, it seems quite as unfair that a *bonâ fide* inventor may have his patent tripped up, as they have been in England, by somebody rummaging out of a closet the same thing which had been made—perhaps an unique specimen of it—fifty years ago, and forgotten ever since.

I am not ignorant that the same may be said, and is said, of other laws as well as the patent law,—that they create the offences they prohibit; that if there were no revenue laws, there would be no such offence as smuggling; that if everybody was allowed to go where he pleases to kill game, there would be no convictions for poaching, and no game-keepers murdered. It is only a pity that arguers of this kind do not go on, as they ought to do, with their own logic, and say that if there were no laws to protect property, nobody would have to be transported for stealing, and that it is by a purely conventional arrangement of society that people are not allowed to settle their differences by gunpowder or arsenic. The short and simple difference between the law of patents and the laws against smuggling, poaching, stealing, and homicide, is, that nobody will venture either to assert that patents are in the smallest degree necessary, or to deny that (until England is prepared to follow the example of "the drab-coloured men of Pennsylvania," or of Spain,) the laws against smuggling are necessary to raise the revenue of the State; that a labourer has no more right to steal the pheasants fed upon the neighbouring estate than the sheep upon the neighbouring common; and that, on the whole, society flourishes better where property and life receive some protection from the law than where they do not.

But this is not all that may be said of the supposed analogy between the frauds and injustice which the patent laws cause or allow, and the frauds and injustice often occasioned by other laws, which are called by the jurists *positive laws*, as distinguished from those founded on natural or moral rights. The revenue laws, of course, are of the positive kind, and in derogation of the *primâ facie* natural right of any man to import or manufacture anything he pleases. And how has the State always dealt with them? Why, as soon as ever it has been made to appear that the expense of maintaining any of those laws bears an unreasonable proportion to the sum which is raised by it; or that in any other way the evils of the tax (and no Chancellor of the Exchequer ever now denies that all taxes are an evil) bear too large a proportion to the advantages, it is at once abandoned and abolished. Apply this analogy to the patent laws, and you will find that, as in every other analogy by which their advocates endeavour to defend them, they are only committing suicide with their own blunderbuss. Grant them on their side (what I do not, in fact) that the patent laws do afford useful encouragement and reasonable reward to inventors; and then consider the annual cost at which these contingent and uncertain rewards are bought; the frauds which the patent laws occasion; their inadequacy to do justice between inventors of the same or similar things, or of things one suggested by the other; the positive injustice which they often inflict by enabling the less meritorious inventor to stop or to supersede the more meritorious one; the general obstruction to science which they cause, and the speculative and gambling spirit which they encourage in inventors, as well as the ignorant and wasteful habit of working in secret, because they dare not ask for information,—I say that no impartial person can doubt on which side lies the balance of inconvenience to the public, and even to the body of inventors themselves.

I am far from supposing that I have said all there is to be said against the patent laws. Perhaps I have even omitted some objections which were made to them by the witnesses before the Committee of 1851; and, by the way, it should be remembered that that Committee only had to decide between cheap patents and dear; and that the question of patents or no patents was only raised incidentally, and was neither tried nor decided by them. Whenever that question does come to be tried, the advocates of patents may depend upon it they will be even more surprised than some of them were when the Chairman of that meeting of the Society, at which I gave my reasons for not patenting my lock,* himself a patentee, both before and since, expressed a strong opinion against the continuance of patents. Considering how very recently the doctrine of no patents has been publicly propounded (in a few speeches in Parliament in 1852), I have been myself surprised at the general disposition which I have found among persons of intelligence and experience to acquiesce in it, as soon as they have had the opportunity and the time to hear and reflect upon the arguments in favour of that doctrine. And even if it is thought premature to talk of abolishing patents until there had been a few years' experience of the new law, I repeat that it is not premature to provide, and with the least possible delay, that, whenever the day shall come for the abolition of patents, thenceforth science and manufactures shall not still remain for fourteen years' afterwards subject to the impediments and interference of nobody can say how many thousands of unexpired patents. And therefore I say, that all the patents now granted ought to be made terminable in fourteen years, or at such earlier period as Parliament may determine that no more patents shall be granted.

Here I had intended to end these letters; but out of respect to Mr. Cole, I will add a few words for the purpose of noticing his letter of last week.

I could quite understand it, and should not have been the least surprised if he had said he was *not convinced* by my answers to the common arguments in favour of patents. But anybody who has done me the honour to read these letters attentively, and still thinks that I have "left the very gist of the question *untouched*," and mentions, as the gist of the question, the right of inventors to protection of their inventions as the result of their labour and as their property, is extremely unlikely to have his opinion changed by either five or fifty more letters such as I could write. And I do not think it would be a very profitable employment of time, even in the long vacation, to write these letters over again in other language, for the purpose of discussing the precise words in which Bentham, Mill, and M'Culloch have expressed the very arguments, or rather dicta (for they are little more), which I have been dealing with throughout, as the arguments in favour of patents.

The fact that hardly any other nation (except Switzerland) rejects patents, which Mr. Cole twice adverts to, and which I had myself alluded to as far as I thought it worth allusion, has plainly nothing whatever to do with the question. It cannot make the evils of patents a bit less, or the advantages of them a bit greater than I have, either wrongly or rightly, represented them to be. It is, in fact, only another form of "the wisdom of our ancestors" argument; by which I fancy that it would be hard to find four persons less likely to be impeded than Mr. Cole and his three authorities, if it happened to stand in their way. We don't usually wait to learn our political economy—of all lessons in the world—from other nations.

I need hardly say I shall have no objection to a discussion of the question at a meeting of the Society whenever it may be brought forward. But I shall not take any step to bring it forward myself, because I think both sides may say what they have to say much better, more deliberately, and with more effect in writing. I shall be very glad to read anything that may be said in reply to these letters, provided it really is a reply, and not either some vulgar compilation of personalities and nonsense or a mere repetition in some new form of words of the old patent arguments which everybody knew by heart long before.

Mr. Jeremy Bentham pronounced from his juridical woolsack, that patents for inventions are "a privilege certainly very advantageous," and "have nothing in common with monopolies." The world is a little older and a good deal wiser than it was in the days of Jeremy; and it is gratifying to observe that Mr. M'Culloch, the most modern of Mr. Cole's three authorities, is much the least positive.

The perception of the evils of patents for invention is undoubtedly of recent growth; but if it proceeds at the rate at which I have been surprised to see it advance within the short time since I first heard it even mentioned, Mr. Brunel and I shall very soon have to express our acknowledgments once more to Mr. Cole, and no longer as a matter of prediction, but of history, for having done so much towards the destruction of patents by cheapening and multiplying them into an intolerable nuisance and obstruction to the arts and sciences.

Yours faithfully,
E. B. DENISON.

Ben Rhydding, Leeds,
12th Sept., 1853.

PATENTS.

SIR,—Notwithstanding the voluminous correspondence on the Law of Patents from very able writers which has lately appeared in the pages of your Journal, the exhaustion of the subject is as far off as ever; and for this reason—that the material point has been totally lost sight of; inasmuch, that there is only one body of men who derive any certain and permanent benefit from these laws—the patent lawyers; for the making out of patents and the disputes arising therefrom are a most fruitful and certain source of revenue.

The case is far different with the patentees as a body; for it may be safely asserted that not one in a thousand realises a fortune, and scarcely one in a hundred ever clears his expenses, while to the remainder the patent is all loss: so that the Patent Law is a downright lottery of the worst description, and has been the ruin of thousands of clever, industrious men. The assertion that without Patent Laws we should have no discoveries, is perfectly absurd, and wholly at variance with the constitution of the human mind; and, further, it would be found, could a strict inquiry be instituted, that more inventions have been lost to the public from inability to take out a patent, than ever will be the case should those laws ever be repealed. It is also well known, that more than half the patents of the present day are not taken out for the beauty or usefulness of any invention, but merely for the sake of the advertisement, as well as that only one guinea of the patentee's very heavy expenses goes to the Crown, the rest being wholly absorbed in the vortices of Chancery and its attendant sprites.

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* As the lock has since been pronounced, by what may be safely called the very best authority—viz., in the Rudimentary Treatise on Locks, by Mr. Tomlinson and *Mr. Hobbs*—to be remarkable for its originality and security (the only English lock of which that quality is admitted by the authors), there can be no doubt that a patent for it might have been not merely obtained, but sustained, and made profitable.

The celebrated case of the crank and its substitute, the beautiful invention of the sun-and-planet-wheel, will show, when displayed in its true colours, to what an extent the public is robbed by the cumbrous machinery of the Patent Laws. Messrs. Bolton and Watt were nearly ruined during the first period of their patent by expenses incurred in prosecutions for infringements, and the defence of their patent rights; in addition to which, they had to take out innumerable fresh patents, in order to secure their previous patented inventions: and so insecure did they feel with all their enormously expensive patent system, that they refused admission to view the Soho Foundry under any recommendation whatever. In consequence of their great expenses, they made application to Parliament for an extension and consolidation of their patent rights to twenty-one years, on the plea that they had not realised sufficient profit.

The public had been paying, therefore, an enormous price for their steam-engines for fourteen years, while the profits were being absorbed by the patent lawyers; and was further called upon to endure this state of things for twenty-one years. It would have been far cheaper for the public to have presented Messrs. Bolton and Watt with 100,000*l.* or 200,000*l.*, and have done with the business altogether.

The inevitable conclusion is, that whatever benefits may be derived from these laws by the patent lawyers, none are enjoyed either by the public or the patentees as a body; and that the evils which flow so abundantly from their continuance are counterbalanced by no sterling advantage or benefit whatever; also, that their total repeal after a certain date will no more extinguish the inventive powers of the human mind than an Act of the Legislature could prevent fire from burning.

I am, Sir, your obedient servant,
HENRY W. REVELEY.

Poole, Sept. 13th, 1853.

PATENTS.

SIR,—The advocates of the abolition of patent-right would do well, I think, to look into the subject of copyright in designs, and to aid them in so doing, I will, with your permission, relate a few facts in connection therewith. I must premise by saying, that in effect, at any rate, copyright in designs and patent-right in inventions are identical,—differing only in extent of term; and I believe the opponents of patent-right do not object so much to the term, as to the principle of granting patents at all. For the effect of both is to give an exclusive right for a limited period. The policy of granting such exclusive privileges for inventions is questioned; let us see how the matter stands with regard to copyright in designs. Prior to 1794, England, in respect of copyright in designs, was in that happy state of nature which Mr. Denison and others so earnestly desiderate; that is to say, every man had full liberty to prey on, and pirate from his neighbours, to copy, imitate, and infringe, and generally to do all those mean and paltry acts which begin in individual, but end only in national demoralisation.

"The original seat of calico printing (says Emerson Tennent on Copyright), was at London, and on the banks of the Thames, where it continued to flourish so long as it was a mere manual operation, dependent for its excellence upon the taste and dexterity of the workmen. But when by degrees its processes became simplified, and production facilitated by the application of machinery to that which had formerly been effected by the hand alone, the great mass of the trade was transplanted, about sixty years ago, to Lancashire, the locality in which fuel and labour were to be found in the greatest abundance. The printers of London were then the most eminent in the kingdom for the good taste and finish of their designs; and the productions of that early period are still looked upon as those of 'the old masters of the English school of calico printing.'

"But as the avowed object of the new colony which had sprung up in Lancashire was cheapness of production, not beauty of design, they at once commenced a system of indiscriminate piracy upon the new inventions of their London competitors; and hence the origin of the Copyright Act in England.

"Such was the incredible activity and dispatch (he continues), with which the productions of the London printers were copied in Lancashire, and poured back into the London market, that they were driven to seek the protection of the Legislature against this ruinous piracy, when, after several Acts renewed and amended, a copyright of three months was, in 1794, finally and permanently established. Thus was given, for the first time, the RIGHTS OF PROPERTY to original patterns and designs, which being like the husbandman's spade, the product of labour, skill, and capital, ought to have been equally sacred and secure." However, it was soon found that the term of three months was quite inadequate for the object in view,—for practically, the pirates enjoyed impunity, inasmuch as before the protection of the law could be obtained through the medium of the Court of Chancery, the copyright had expired, and the pirate was at liberty to continue his operations. Sir, it has been contended that if patent privileges were abolished, men would not pirate one from another, but rather emulate each other in producing good inventions. Let us see how it was with designs before the passing of the present law; that is, when a term of three months' (inadequate) protection was given. The principle of property in designs had been established; the law declared it to be an offence to imitate registered designs, though by its delays in administration it afforded opportunities for committing such acts; in spite of this we shall see that a wholesale system of piracy was carried on, and even unblushingly avowed. For instance, a Manchester magistrate, one Mr. Brooks, stated, in his evidence to the House of Commons, that he had been a most extensive copyist of other men's designs; that he did just as many as answered his purpose; that he generally printed his copies on such inferior cloth as enabled him to ask a lower price than the original producer (*i. e.* inventor); that if he had been proceeded against for damages, he would have defended the action, *though aware he was in the wrong*, and have trusted to the length of his purse. And another witness, Mr. L. Lucas, in his evidence, stated that he was in the habit of receiving from abroad patterns of prints, which were reproduced at Manchester, irrespective of the rights of the inventor or original producer. He stated further that he could take any pattern, and find a copyist to print it. It is as well to add, that this gentleman declared himself to be opposed to all copyright. No doubt of it; and I dare say he is equally opposed to all patent right. A Mr. Brooke stated that such was the extent of piracy, that at one time every pattern produced by his house was copied by a rival establishment. Another witness relates how his entire stock was lost by piracy; and another says the consequences of this illegal and immoral copying were ruinous to him, inasmuch as his whole trade was paralysed. That highly intelligent and most clever man, Mr. Applegath, stated "that his business was one of perpetual risk and anxiety; that with every desire to advance the character of his productions by the introduction of art of a higher class, he was deterred from doing so; *that he abstained as much as possible from inventing new designs*, finding it safer to make up patterns one with another, to baffle the copyist, and to make a trade by *it* rather than by excellence;" and further, that he would have produced new designs made by Sir David Wilkie and other eminent artists, but that it was of no use to do so, for they would have been immediately copied, and thus he would have lost his reward. Mr. Denison and others ridicule the notion of any stimulus being wanted to foster invention, and scout the idea of retrogression in manufacture. But what was the case with design? Mr. Barbour, an eminent export agent in Manchester, in his evidence, distinctly states, "that there was a decided falling off in the style of prints in Lancashire, a decline which he attributed to the want of any stimulus being applied to the improvement of design, owing to the prevalence of copying and the reproduction of the same patterns by different printers upon cloth, of unequal quality, instead of producing two distinct classes of quality." Mr. James Thomson, F.R.S., another witness, says, "I have the good fortune to possess a volume of drawings of the period in which pattern drawing is elevated to the dignity of fine art. The art of printing since that time has made gigantic strides, and is now one of the most beautiful and refined of the chemical arts. The art of designing has at the same time retrograded," &c., &c.; and why? The art of calico printing was fostered by numerous patents; the art of designing was open to the copyist; hence the retrogression. The writer I have quoted goes on to say, "At present there is actually a *community* of *property in designs* (this is just what is wanted now in inventions of all kinds), which confounds the most uneducated and the most cultivated genius in one indiscriminate body, confusing all grades of merit, and levelling all superiority of talent. In this position of the trade, to devote extra pains to the composition of designs, is to incur labour and cost without remuneration or repute." Nay, he is bold enough to assert that, unless adequate protection is given, the trade will be engrossed by those who are wise enough to see their own interest in giving such protection. As we all know, the law was altered; a copyright varying from nine months to three years was given, and the effect has been the almost total cessation of piracy, and a very decided improvement in the art of designing. No Act of Parliament, I venture to say, ever effected more good than that of the 5th & 6th Vict. cap. 100. We seldom hear of a trial for infringement of copyright; yet we know that the Act is most extensively resorted to by manufacturers who, indeed, register nearly all their patterns. If, then, it be necessary to afford protection or copyright to designs, which, indeed, are the offspring of thought and labour, but nevertheless of an inferior kind, and of less extent than is Invention in the Arts; how can it be contended that patent right is wrong in principle, unnecessary, and prejudicial? Let us suppose that we have been talking of looms instead of patterns, or of printing instead of designing patterns. Is it to be supposed that manufacturers who scrupled not to imitate and copy designs, would hesitate to copy the improvements of their more skilful brethren in machinery or in chemical art? Is it likely that when a weaver saw that his neighbour had effected some alteration in his loom by which he could produce his cloth a trifle cheaper, that he would abstain from adopting the same improvement so soon as he discovered its nature? To make a new design for calico printing would require no large outlay of capital, and, perhaps, but a very short space of time; yet to copy was found more profitable than to design, and undoubtedly to adopt an improvement in the loom without the trouble or cost of experiment, would be much easier and more profitable than to incur the expense and labour of making one. He that would abolish patent right must extinguish copyright in designs, in sculpture, and in literature, for they have one common origin, and one common end.

I am, Sir,
Your obedient Servant,
A MEMBER.

PROCEEDINGS OF INSTITUTIONS.

LIVERPOOL.—Last Thursday evening, Mr. Leone Levi delivered the first of a course of lectures on the "Commercial Law of the World," in the Collegiate Institution. Mr. Levi referred to the early systems of legislation of the Greeks and Romans; to the legislation of the Italian States, Mediterranean, and of France; to the Consulato del Mare, and other maritime codes. He completed his review by comparing the present state of the law throughout the Continent and America, and afterwards enumerated the countries which were subject to the law of England. The Rev. J. Saul Howson, who presided, observed, that it seemed to him beyond a doubt, that a knowledge of the main features of commercial law ought to form a part of a merchant's education. He was not alone in that opinion. In a recent tour on the Continent he had visited two large and flourishing schools of commerce; one at Leipsig, and the other at Paris. At the former, the principles of law and political economy, in their connection with commerce, were systematically taught to young men intended for business. At the latter, the mercantile code of France was regularly learnt by heart, and made the basis of farther comment.

MASHAM.—The Mechanics' Institute, in this place as enrolled as members, one in eight, of the population. It has an evening class in successful operation; is supported by all classes in the town, and has recently purchased 150 volumes for the library, from the proceeds of a *soirée* lately held. The opening lecture, for the session, was delivered by the Rev. T. E. Wycherley, Masham, on Tuesday, September 6th, "On Mechanics' Institutes, and the advantages derived from them by the places in which they exist." The Lecturer not only proved how many advantages society generally reaped from them; but, also, the benefit conferred by Mechanics' Institutes on individuals, known and unknown to fame, who had been members of such Institutions. Their inventions, discoveries, and efforts to benefit the class from which they sprung, were placed before the audience in a pleasing style, and commended as examples worthy of imitation.

Tamworth. — The Committee of the Tamworth Library and Reading-room have determined to postpone the Annual Meeting of the delegates from the various Institutions, comprised in the Midland Association of Mechanics', and similar Institutions from the 20th instant, the date previously fixed, until Tuesday the 25th day of October next.

MISCELLANEA.

Electric Telegraph without Wires.—Mr. Lindsay, of Dundee, a mathematical teacher, who has for many years followed up numerous experiments on galvanic electricity and the telegraph, has recently delivered lectures in Glasgow, accompanied by experiments, to show the possibility of rendering the action complete without wires, merely employing the water of the ocean as a conducting medium.

The Proposed Scottish Industrial Exhibition —The "Interim Acting Committee" for promoting a Great Industrial Exhibition for Scotland have come to the resolution not to attempt to carry out the proposal *next year*, as originally announced. This decision is considered to be "prudent," as the undertaking had not received support and encouragement from those whose names would give confidence to the people of Scotland in a matter of the kind.

African Cotton.—A sample of cotton grown near Abbeokuta, on the Gold Coast, has been recently shown to us (*Manchester Guardian*), from which it appears that the green seed variety of the cotton plant—similar to that which produces Upland and New Orleans cotton—grows wild on the coast of Africa, as well as the black seed variety, from which the African cotton previously received in this country appears to have been produced. The sample in question is of remarkably strong staple, and the cotton would be very useful if it could be procured in quantity. The plant is said not to produce largely, but the fault would probably be amended by culture.

A Flying Chariot.—A model of a vehicle constructed for the purpose of aërial navigation has been deposited in the Exhibition at Dublin. It is the invention of Lord Carlingford, and, in a communication to a friend, it is attempted to be proved that it fully bears out its right to the above appellation. It is said to have two expanding stationary wings to bear its weight, and two screw wings in front to draw it forward. It does not, however, appear to satisfy its inventor, who is about constructing another with improvements, which is to be much lighter. The scientific world are invited to contribute their mite of information.

Removal of the School of Design from Somerset-House.—During the last few weeks the School of Design, with its ornamental casts, and various artistic apparatus for teaching, has been gradually removed from Somerset-House, where, in the rooms formerly occupied by the Royal Academy, it had been located from its commencement, in 1837. The removal is now completed, and the rooms given up to the Registrar-General of Births, Deaths, and Marriages. The School is removed to Marlborough-House, and will form part of the Central School of Art, of the Department of Science and Art. The several district schools already established in the metropolis, at the Mechanics' Institute, Westminster, St. Thomas Charterhouse Schools, Finsbury, and about to be established in St. Martin's parish and elsewhere, will supply the elementary instruction in art formerly given at Somerset-House, whilst the higher branches will be taught at Marlborough-House.

Universal Exhibition of the Fine Arts in Paris of 1855.—The Department of Science and Art at the Board of Trade have issued the following notice to artists in reference to the forthcoming Exhibition in Paris: "The Board of Trade has received information from the Secretary for Foreign Affairs stating that the French Ambassador has communicated to him that a universal Exhibition of the Fine Arts is to take place at Paris, in May, 1855, at the same time as the Exhibition of Industry. The French Government expresses a desire that this Exhibition may be as complete as possible, and that its organisation may be arranged in a manner to give satisfaction to every nation invited to assist in it. The artists' works will be forwarded gratuitously to Paris, and the arrangement of them will not entail any expense on the artists exhibiting. Information of further arrangements will be afforded as soon as they are made. Henry Cole, Lyon Playfair, Joint Secretaries. —Marlborough-house, Sept. 9, 1853."

Modification of Bunsen's Battery.—From experiments recently followed up by MM. Liais and Fleury, it has been found that when the diaphragm of a Bunsen battery is suppressed, the carbon being porous, and impregnated with nitric acid, the internal conductibility of the pile is increased fivefold. One simple experiment shows the fact—an element thus modified caused an electro-magnet to support nearly six tons. To arrive at the same result, by increasing the surface of the old pile, it was necessary to connect five Bunsen elements by their similar poles, so as to form one element of five times the surface. To keep the porous carbon impregnated with nitric acid, it is surrounded by a glass cylinder, so as to keep an annular space between, which is filled with nitric acid. The two cylinders are fastened together at their lower ends with clay or cement; the carbon being placed, a cavity may be drilled in it, and by introducing a diaphragm, and charging on the carbon side with concentrated sulphuric acid, and on the zinc side with dilute acid, as usual, the conductibility of the battery is almost the same as in the original Bunsen battery, but the tension is nearly doubled. One element behaves like a Bunsen battery of several elements, but costs much less.

Ozonometer.—Dr. John Drew, of Southampton, has recently issued a circular, in which he gives the following description of Dr. Schonbein's method of ascertaining the amount of ozone in the atmosphere. The ozonometer consists of twelve bundles of paper, prepared with iodine and starch; each bundle contains sixty strips, and serves for one month's observations; a spare set is added for additional observations during thunder storms, or whenever the air may appear to be overcharged with electricity. At nine o'clock every morning, a strip of the prepared paper is to be suspended in a spot to which the air has free access, but not the sun. It must be removed from dung heaps, stables, &c., where gases are developed which would vitiate the observation. At nine o'clock in the evening the exposed strip is dipped in water. It will be found to assume a purple tint. The depth of this tint is compared with the corresponding colour on a scale, on which there are ten gradations, and the number is to be inserted in the register with which it agrees in depth. Another slip of paper must be exposed at nine P.M., and examined and registered in a like manner at nine A.M. on the following morning. At the close of each month, the mean is to be deduced, by dividing the sum of the numbers registered by the number of observations.

The Plough as an Instrument of Culture.—Mr. Mechi, in a letter to the editor of the *Times*, says, "A calm and rigid investigation and computation have convinced me that the doom of the plough, as an instrument of culture, is sealed; and that the rotatory forking, or, as it is wrongly called, digging machine, is the only profitable cultivator. Even with six or eight horses, it is cheaper and infinitely more effective than the plough. Since the trial of implements at my "gathering," I have received from one of our North American colonies the model of a newly-invented machine, which, by a happy and most simple combination of horse and steam power, will—and I pledge my agricultural reputation for it—not only deeply, cheaply, and efficiently cultivate and pulverise the soil, but at the same time sow the seed, and leave all in a finished condition. It will also, by a simple inversion, cut and gather the corn without any rake or other complication; while both in cultivation and harvesting its operation will be continuous and without stoppage. The implement when complete will weigh about twenty to twenty-five cwt., will require a pair of horses, and will represent the power of about eight to twelve, or more, real horses. The implement for digging will require one man and one boy only, including the management of the steam-engine; in reaping, the same, with the addition of three men to bind as the corn falls into their arms. The men will be carried on the machine. I trust I need hardly say that I shall have no pecuniary interest in this matter. The invention has been duly secured."

QUICKSILVER MINERS.—The diseased forms of the men working as excavators belong only too prominently to a picture of Almaden. You meet men in the streets with wasted faces, feted breaths, and trembling hands —blind, paralytic. The heat in the lower workings of the mine is very considerable; ventilation is imperfect; vapour of quicksilver floats upon the air, and condenses on the walls, down which it trickles in little rivulets of pure liquid metal. Even visitors are sensibly affected by it, and retain for some time the metallic flavour in their mouths. The miners, who number more than 4,000, are divided into three gangs, or watches, working six hours each, and leaving the fourth six hours of the twenty-four—from ten at night till four in the morning—as an interval of perfect rest. On account of the heat, and the deleterious nature of the vapour, summer is made the idle time, winter the great period of activity among the population. As the winter closes, the appearance of the miners begins very emphatically to tell its own tale, and great numbers hasten to their native plains and mountains to recruit. Their homes are chiefly scattered about Estremadura, Andalusia, and Portugal. Crowds of Portuguese, after harvest, flock to obtain employment at Almaden, selling not their labour only, but their health. The most robust cannot work in the mine longer than for about fourteen days in succession, generally eight or nine days make as long a period of such labour as can be endured without rest. Those who exceed that time are obliged eventually to give up work, and breathe unadulterated air for perhaps two months together. If they work without due precaution, and almost inevitably if they indulge in wine, miners at Almaden, aged between twenty-five and thirty, waste away, lose hair and teeth, acquire an insufferable breath, or become sometimes afflicted with tremblings that render them unable to supply their own wants; they have to be fed like infants. If the disease be not checked vigorously, cramps and nervous attacks of the most agonizing kind follow upon these symptoms, and lead on to death. They who work within due bounds, and live moderately, using a good deal of milk, if they take care always to cleanse their persons thoroughly after each six hours' work—the full day's labour—live not seldom to old age. These diseases afflict the miners only. The men engaged upon the ore and quicksilver outside the mines, in smelting and in other operations, do not suffer."—*Dickens's Household Words.*

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

From Gazette, 9th September, 1853.

Dated 18th May, 1853.

1219. G. Underwood, Strichill, Roxburghshire—Preparation of sulphate of iron.

Dated 28th May.

1314. G. Harriott, Islingham, Frindsbury, Kent—Crushing and rolling land.
1324. J. H. Johnson, 47, Lincoln's-inn Fields — Removing gummy matters from fabrics. (A communication.)

Dated 5th August.

1828. J. Lallemand, Besançon—Paper from peat.

Dated 10th August.

1862. T. MacSweney, America-square, London—Construction of ships.

Dated 11th August.

1876. W. Longmaid, 65, Beaumont-square, Mile-end—Manufacture of manure.

Dated 18th August.

1897. J. Perkins, Manchester—Manufacture of oils.

Dated 22nd August.

1950. W. Schmollinger, Gracechurch-street, and E. G. Smith, Lambeth—Converting reciprocating into rotatory motion.
1952. J. Steven, Edinburgh—Axle-box for railway carriages.
1954. V. E. Warmont, Neuilly, France—Dyeing.

Dated 23rd August.

1956. C. Cowper, 20, Southampton-street, Chancery-lane—Permanent way. (A communication.)
1958. M. Poole, Quartz-crushing, &c. (A communication.)
1960. T. C. Medwin, Blackfriars-road—Steam-engine boilers.
1964. W. Mann, Stepney—Purification of gas.

Dated 24th August.

1966. A. E. L. Bellford, 16, Castle-street, Holborn—Fire-arms. (A communication.)
1967. B. H. Hine, A. J. Mundella, and T. Thompson—Machinery for textile and looped fabrics.
1969. T. Foster, Manchester—Machinery for etching or engraving on plain or other surfaces.
1970. T. Hill, Glasgow, and A. Thomson — Pipes or hollow articles.
1971. G. Pollard, 64, Watling-street, and G. Mumby, Hunter-street, Brunswick-square—Manufacture of envelopes.
1972. A. E. de R. Hely, Cannon-row, Westminster—Shades or chimnies for lamps.
1973. A. Swonnell, Kingston-on-Thames—Construction of tie for neckcloths, &c.
1974. E. Heard, Regent-street, Lambeth—Composition for rendering sea-water fit for washing.
1975. C. C. Banks, Clapham—Lubricators.

Dated 25th August.

1976. A. B. Tompson, Richmond—Spring door-hinge. (A communication.)
1977. W. Austin, 27, Holywell-street—Blocks of plastic materials for building.
1979. G. Davis, London—Apparatus for distinguishing counterfeit coin.
1980. R. A. Brooman, 166, Fleet-street—Machinery for digging, &c. (A communication.)

Dated 26th August.

1981. R. A. Brooman, 166, Fleet-street—Treatment of wool and silk, and machinery for same. (A communication.)
1982. E. De Varroc, Great Chesterfield-street—Depriving caoutchouc of unpleasant odour.
1983. R. Wilson, Glasgow—Textile fabrics.
1984. W. Watson, jun., Leeds—Prussiate of potash.

Dated 27th August.

1985. R. Roberts, Manchester—Casks.
1986. A. L. Bargnano, New York—Manufacture of paper and pasteboard.
1987. W. Hargreaves, Bradford—Machinery for combing wool, &c.
1988. C. W. Lancaster, New Bond-street—Machinery for manufacturing gun-barrels.
1989. J. Hill, Stalybridge—Spinning machinery.
1990. R. Helbronner, 3, Spring-terrace, Vauxhall-walk, Lambeth—Chemical light, and apparatus for same.
1991. J. D. M. Stirling, The Larches, Birmingham—Rails and tyres.
1992. H. G. Collier, Paris—Rotary pumps.
1994. A. V. Newton, 66, Chancery-lane—Steam-hammer. (A communication.)
1995. Dr. G. Robinson, Newcastle-upon-Tyne—Application of slags and refuse.
1996. E. Lacy, Handsworth, Staffordshire, and W. Wilkinson, Nottingham—A new description of cloth.
1997. J. Hornblower, Poplar—Steering vessels.

Dated 29th August.

1998. J. Foss, 15, Aldgate—Printing apparatus.
1999. A. Berend, 3, Fenchurch street — Instantaneous light apparatus. (A communication.)
2000. J. Cundy, 21, Victoria-road, Kensington—Kitchen range and cooking apparatus.
2001. E. P. Gribbon, Dublin—Window-frames and sashes.
2003. P. A. le Comte de Fontainemoreau, 4, South-street, Finsbury—Improvements in production of electricity. (A communication.)

Dated 30th August.

2005. J. Bald and C. Maitland, Carsbridge Distillery, Alloa, Clackmannan, North Britain—Improvements in distilling.
2007. C. Goodyear, Avenue-road, St. John's-wood—Combining India-rubber with other matters for writing, &c. (A communication.)
2008. C. Goodyear, Avenue-road, St. John's-wood — Rules, scales, &c.
2009. C. Goodyear, Avenue-road, St. John's-wood—Coating India-rubber articles.
1010. J. Cundy, 21, Victoria-road, Kensington—Gas-stove.
2011. J. Picciotto, Crosby-square — Burning and reburning animal charcoal. (A communication.)
2012. A. V. Newton, 66, Chancery-lane—Dyeing and bleaching. (A communication.)
2013. W. E. Newton, 66, Chancery-lane—Machinery for cleaning bran in manufacture of flour.
2014. W. E. Newton, 66, Chancery-lane—Machinery for cleaning seeds, &c. (A communication.)

Dated 31st August.

2015. E. W. Burrows, Pentonville—Cranes.

2016. A. P. Price, Margate—Treating wash-waters containing soap, and obtaining products therefrom.
2017. T. Dawson, King's Arms-yard, London—Fishing-rods.
2018. G. Meusnier, Paris—Carriage clocks.
2019. E. Smith—Improved manufacture of carpets.
2020. W. E. Newton, 66, Chancery-lane—Reaping-machine. (A communication.)
2021. W. E. Newton—Machinery for making casks, &c. (A communication.)
2022. W. B. Johnson, Manchester—Steam-engines.
2023. H. J. Iliffe and J. Newman—Manufacture of buttons.
2024. J. P. Grazebrook, Audnam, near Stourbridge, Staffordshire—Improvements in working barrels of pumps.
2025. R. A. Brooman, 166, Fleet-street—Paddle-wheels. (A communication.)

WEEKLY LIST OF PATENTS SEALED.

Sealed 7th September, 1853.

569. William Mathews, of Nottingham—Improvements in Pianofortes.
583. Charles Baker, of Southampton — Improvements in moulds for the manufacture of bricks.
588. James Veevers, of Littleborough, and Henry Ashworth, of the same place—Improvements in machinery or apparatus to be employed in the preparing of cotton and other fibrous materials for spinning.
594. Samuel Blackwell, of Oxford-street—Improved strap or band for connecting together certain parts of harness and saddlery, applicable also to other purposes where straps or bands are used.
595. Samuel Blackwell, of Oxford-street—Improvements in saddlery and harness.
598. William Pidding, of the Strand—Improvements in the treatment or manufacture of caoutchouc or gutta percha, in fabrics obtainable therefrom, and in the machinery or apparatus employed therein.
599. George Chambers, of Russia-row, Cheapside—Improved means of gathering cinders and depositing ashes under fire-grates, securing economy in fuel and cleanliness of appearance.
606. Frederick William Campin, of the Strand—An instrument for measuring the steerage way of vessels, and the rapidity of currents of water and air, applicable to ventilating ships and railway-carriages. (A communication.)
626. Thomas Evans, the younger, of Tooley-street—Improvements in the construction of steam-boilers.
640. William Stevenson, of Johnstone—Improvements in the treatment or manufacture of textile materials.
645. François Durand, of Paris—An improved kind of loom.
648. Ephraim Sabel, of Broad-street-buildings—Improvements in the construction of looking-glasses, and in the apparatus connected therewith. (A communication.)
649. George Knight, of Birmingham, and John Hentage, of Warwick—An improvement or improvements in drying bricks, and such other articles as are or may be made of clay.
652. Williams Malins, of Saville-row—Improvements in the application of atmospheric propulsion upon railways.
669. Richard Archibald Brooman, of Fleet-street—An improved machine for weighing or measuring and packing spices, drugs, coffee, and like matters. (A communication.)
688. William Whitaker Collins, of Buckingham-street—Improvements in looms for weaving. (A communication.)
744. Luke Smith, of Littleborough, and Matthew Smith, of Haywood—Improvements in machinery for weaving and printing.
778. John Smedley, of Lea-mills, Matlock—Improvements in machinery or apparatus for opening, cleaning, blowing, or scutching animal wool, cotton, or other fibrous substances or materials.
828. William Johnson, of Lincoln's-inn Fields — Improvements in the production of ornamental surfaces in glass, porcelain, metals, and similar materials. (A communication.)
861. John Fuller Boake and John Reily, both of Dublin—Improvements in signal-posts for railways, and apparatus connected therewith.
919. John Lethwaite, of Halifax—Improvements in rollers or mountings for blinds, maps, and other like articles.
927. Isaac Simpson, of Preston, Lancashire—Improvements in machinery for covering wire, silk, cotton, linen, wool, or any other flexible material, with wire, plate, silk, cotton, linen, wool, or any other flexible material.
940. William Hale, of Swan-walk, Chelsea—New kinds of fire-arms.
950. Richard Archibald Brooman, of Fleet-street, London—Improvements in reaping and gathering machinery. (A communication.)
978. Thomas Knowles, of Newton, Lancashire—Improvements in the machinery or apparatus for picking warps.
979. Frederick John Wilson, of Cadogan-place, Chelsea—An improved wheelbarrow.
1009. Samuel Plimsall, of Fullwood, Upper Hallam, Sheffield—For more thoroughly and effectually cleansing, extracting, and separating or fining ale, beer, porter, bitter beer, India pale ale, and other malt liquors, from the yeast, bottoms, barm, sediment, and other extraneous matters and impurities with which it may be in combination.
1017. James Eagleson Anderson Gwynne, of Essex-wharf, Strand—Improvements in the treatment or manufacture of peat and other substances to be used as fuel.
1150. William Johnson, of Lincoln's-inn Fields — Improvements in machinery or apparatus for sewing. (A communication.)
1190. George Fitzjames Russell, of Duke street, Adelphi—An apparatus for disengaging, lowering, and raising ships' boats.
1310. William Henry Bentley, of Bedford—Improvements in locks and keys, parts of which are applicable to window-sashes and doors.
1403. George Tillett, of Kentish-town—Improvements in portable houses and buildings.
1433. William David Paine, of Thomas-street, Stamford-street, and George Alfred Paine, of Clarke's mews, St. Marylebone—Improvement in the construction of steam-boilers and in steam-boiler furnaces.
1476. Auguste Edouard Loradoux Bellford, of Castle-street—Improvements in machinery for pulverizing and washing quartz or ore, and for amalgamating the gold contained therein. (A communication.)
1498. George Young, of Neath—Improvements in grinding wheat and other grain.
1553. Richard Archibald Brooman, of Fleet street—Improvements in printing, or in producing designs and patterns on stuffs and fabrics. (A communication.)
1570. George Arthur Biddell, of Ipswich—Improvements in apparatus for cutting vegetable and other substances.
1611. William Woods Cook, of Bolton—Improvements in the manufacture of woven or textile fabrics.
1630. Louis Brunier, of Norfolk-street, Strand—Improvements in obtaining power by compressed air.
1631. Stephen Martin Saxby, of Brussels—Improvements in apparatus for lowering ships' boats, and for holding and letting go tackle.
1632. Moses Poole, of the Avenue-road, Regent's-park—Improvements in the manufacture of printing-rollers.
1648. Fabian Wrede, of Stockholm—Improvements in gas and air-engines.
1662. Abraham Walker Craig, Daniel Foster, and Thomas Valentine, of Belfast—Improvements in preparing for weaving wet spun yarns of flax and tow.
1667. Arnold Morton, of Cockerill's-buildings, Bartholomew-close, London—Improvements in the manufacture of paints, pigments, and materials for house-painting, paper-staining, and decorative purposes generally.
1677. John Yules, of Glasgow — Improvements in rotatory engines.
1678. William Little, of the Strand—Improvements in the manufacture of lubricating matters.
1685. Charles Liddell, of Abingdon-street—Improvements in moving boats on canals and rivers.
1700. Jacques Rives, of Rue Motay, Paris—Improvements in trusses for the cure or alleviation of hernia.
1701. Benjamin Burrows, of Leicester—Improvements in Jacquard apparatus.
1703. Samuel Colt, of Spring-gardens—Improved machinery for boring metals. (Partly a communication.)
1721. Alexander Cochran, of Kirkton Bleach-works, Renfrew—Improvements in finishing muslin and other fabrics.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietor's Name.	Address.
Sept. 8	3508	A Tail Pin-breech for Gun and Pistol-barrels	Thomas Turner and John Field Swinburn	Birmingham Gun Manufactory.
,, ,,	3509	Improved Jar	Doulton and Watts	Lambeth Pottery, High-street, Lambeth.
,, ,,	3510	Button	William Aston	Birmingham.
,, ,,	3511	Antigropelos..	John Wheeler Jones and William Westley	Bartlett's-buildings, Holborn.